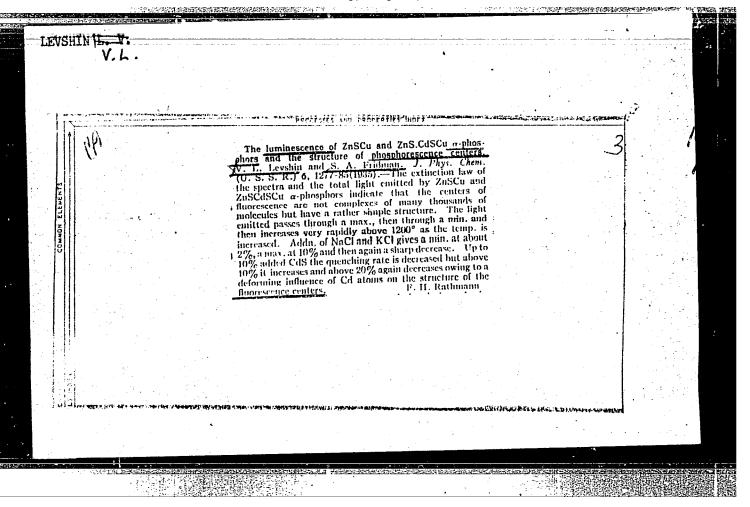
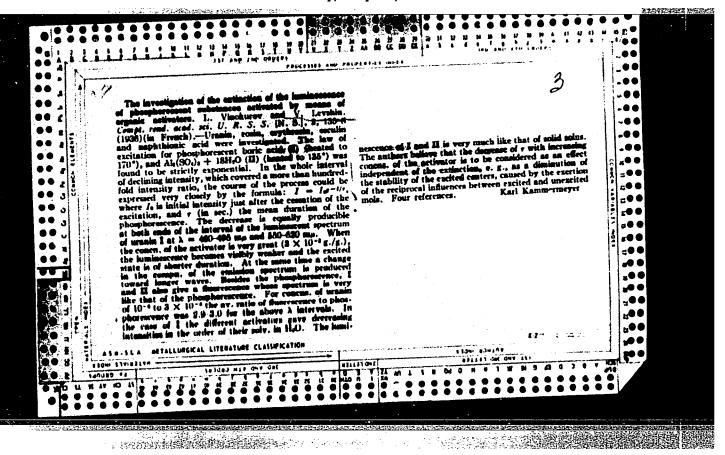


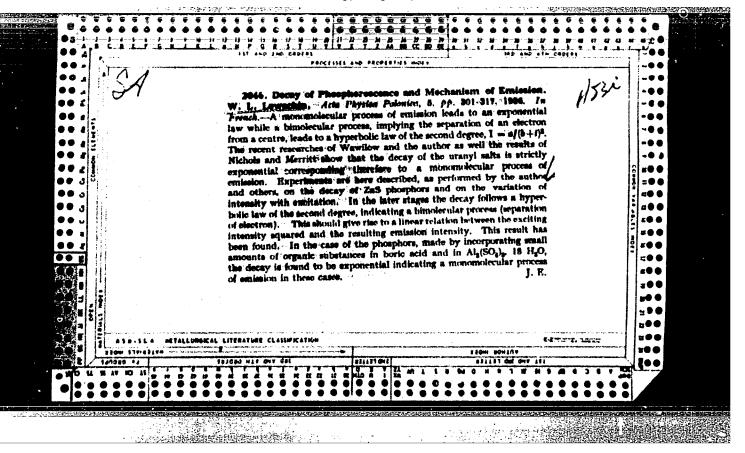
"APPROVED FOR RELEASE: Monday, July 31, 2000

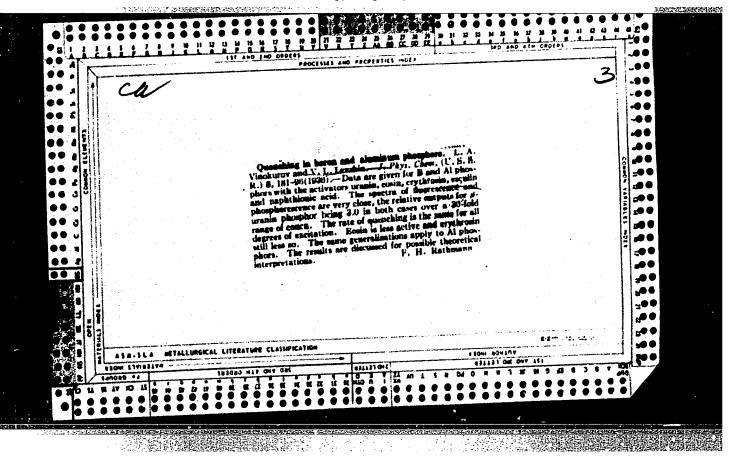
CIA-RDP86-00513R000929710

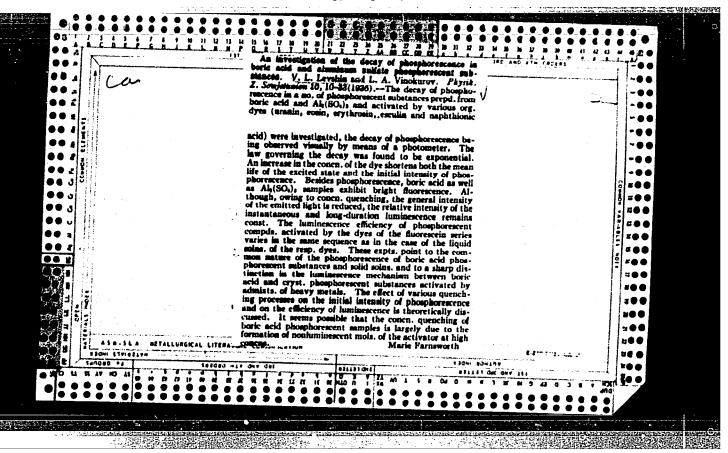


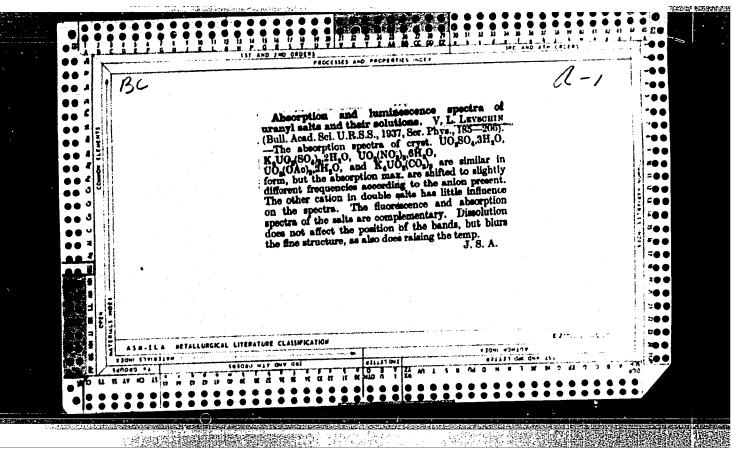
LEVSHIN, Vadim Leonidovich, 1896Phosphorescent materials Moskva, Izd-vo Akademii nauk SSS, 1936. 134 p. (Seriia nauchno-populiarnaia)

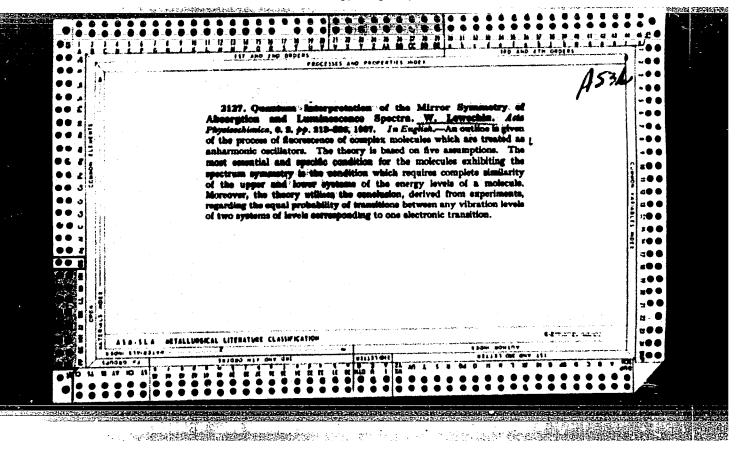


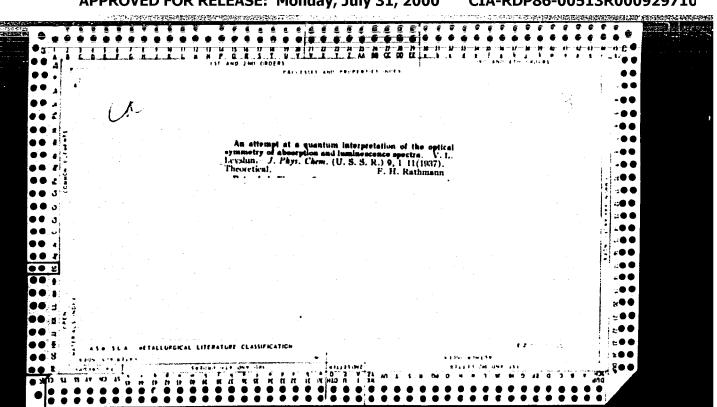




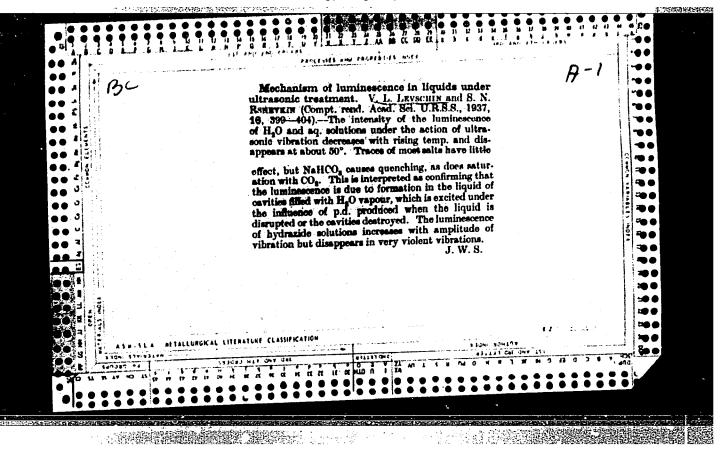


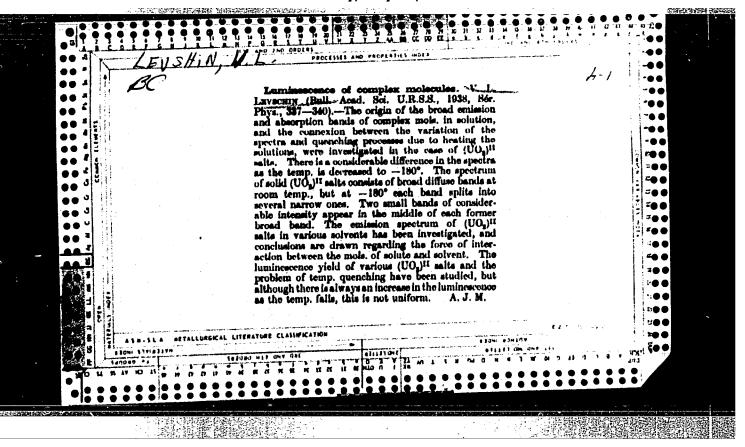


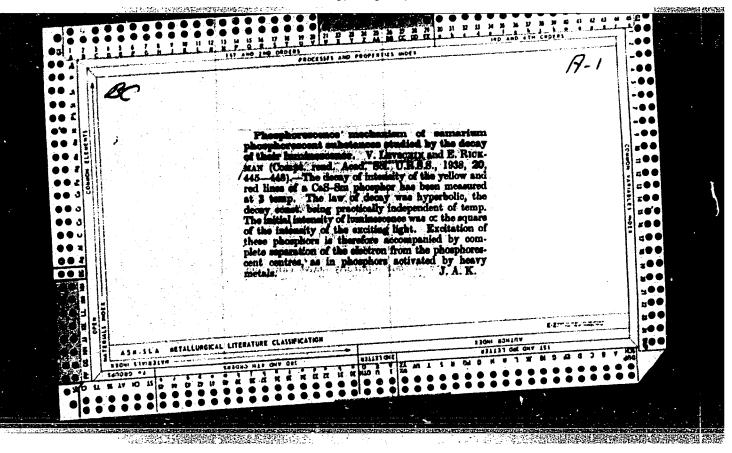




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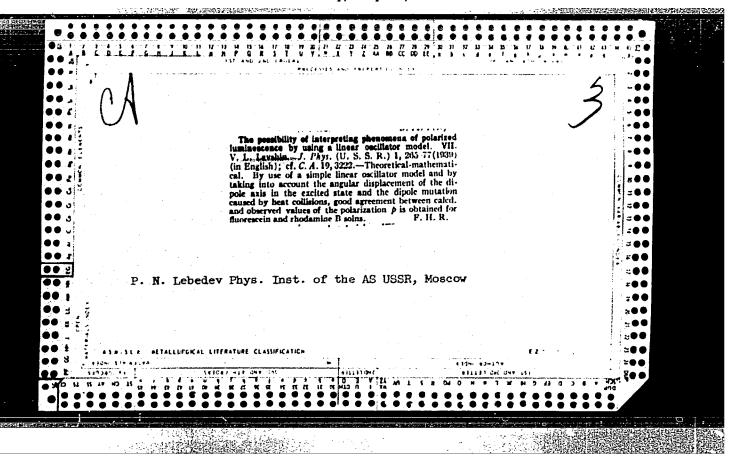






"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000929710



LEVSHIN, V. L

"Decay of Luminescence in Certain Classes of Luminsecent Substances (Al $_2$ O $_3$ Cr, Cdl $_2$ MnCl $_2$, Zn $_2$ SiO $_4$ Mn)," Dok. AN 25, No. 2, 1939.

P. N. Lebedev Physical Inst. AS, Moscow

LEVSHIN, Vadim Leonidovich

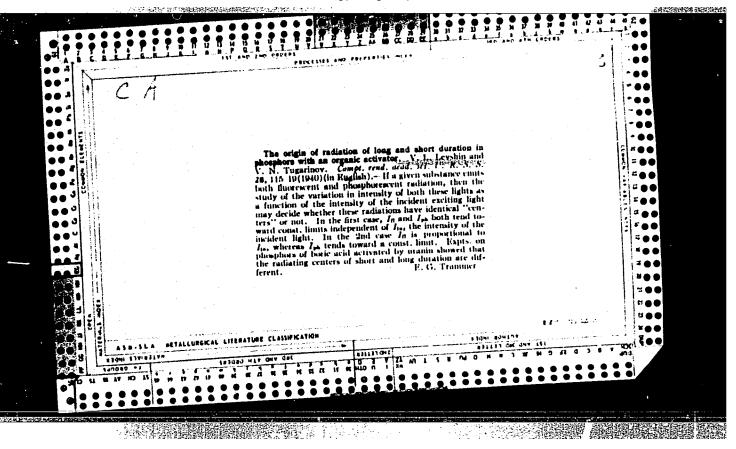
"A Study of Decay of Certain Classes of Luminescent Substances," Iz. Ak. Nauk SSSR, Ser. Fiz. 4, No. 1, 1940.

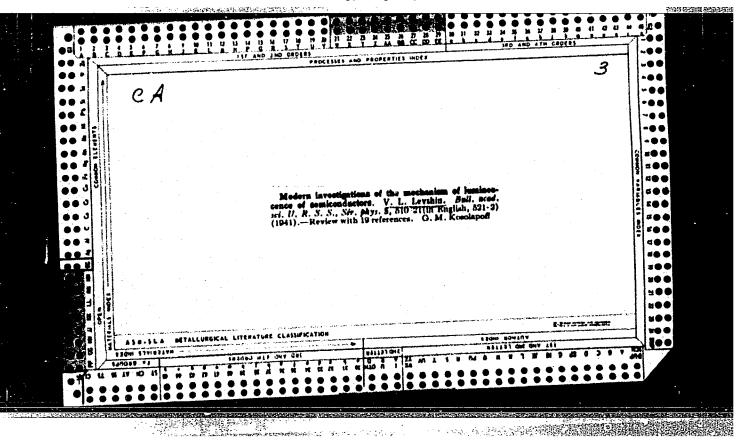
P.N. Lebedev Physical Institute of the Academy of Sciences of the USSR, Moscow.

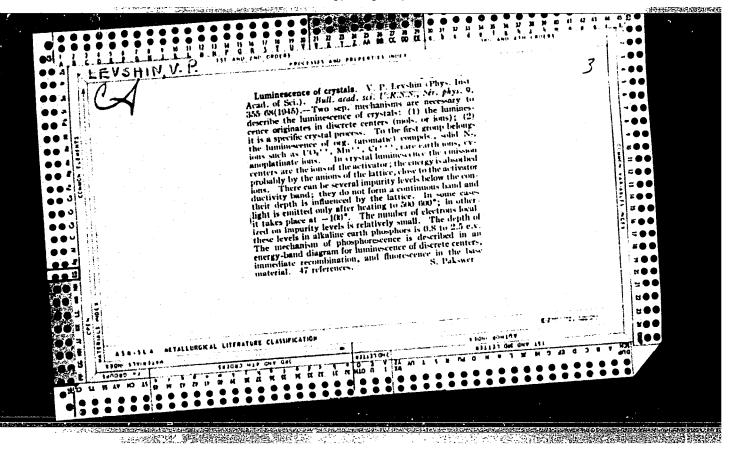
LEVSHIN, Vadim Leonidovich

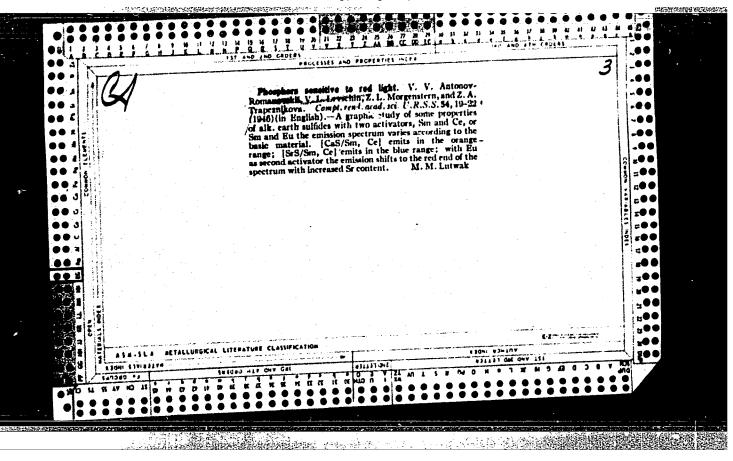
"On a Number of Luminescent Substances Used to Increase the Efficiency and to Correct the Spectral Composition of Radiation of Mercury Lamps," Iz. Ak. Nauk SSSR, Ser. Fiz. 4, No. 1, 1940.

P. N. Lebedev Physical Institute of the Academy of Sciences of the USSR, Moscow.



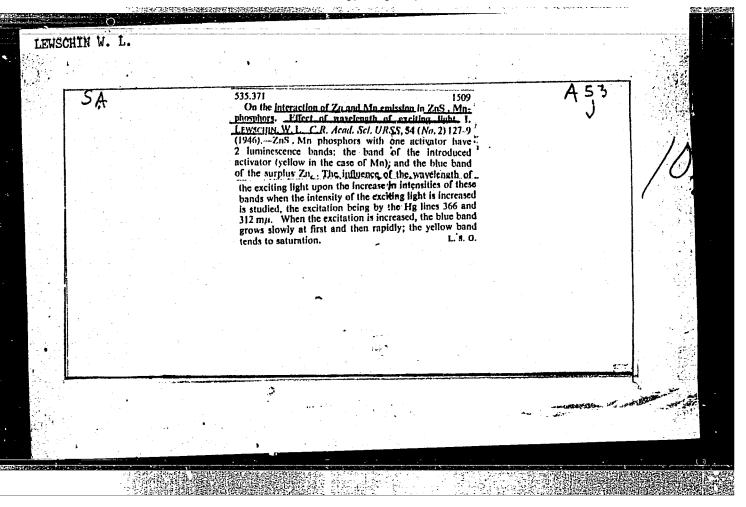


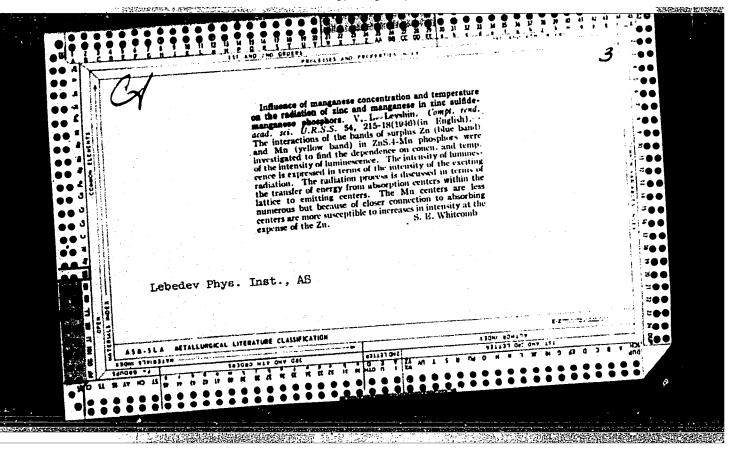


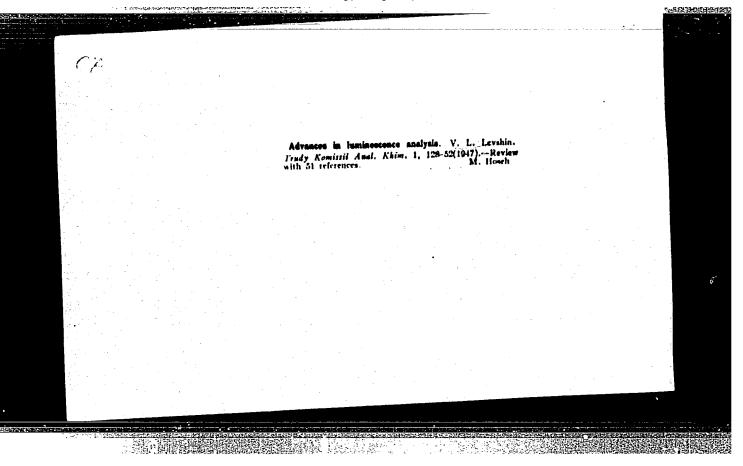


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CIA-RDP86-00513R000929710







LEVSHIM, V.L., professor (Moscow).

Remarks on plans for the curriculum in physics in secondary schools. Fiz.v shkole 7 no.2:42-43 '47. (MLRA 6:11)

(Physics--Study and teaching)

USAN/Physics
Optics
Light

"Thirty Years of Soviet Optics," Prof V. L. Levshin,
Dr Phys Math Sci, 4 pp

"Neuka 1 Zhisn!" No 10

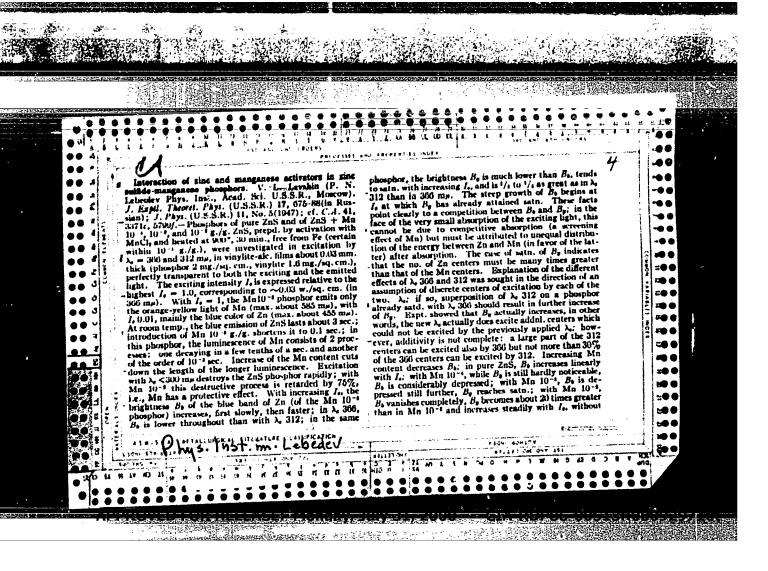
General historical account of 30 years of develop-

General historical account of 30 years of development in Soviet optics. Briefly discusses work in fields of nature of light and properties of elementary emissions; spectral study of structure of matter; optic studies of molecular states and actions of light; and applied optics, its practical utilization, and construction of optical instruments.

58r97

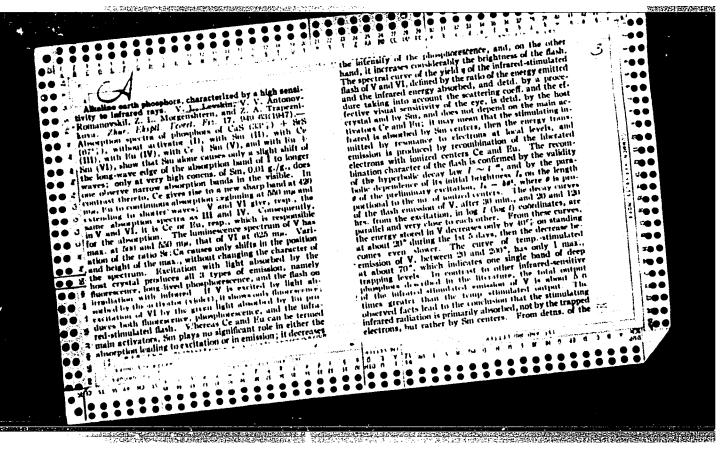
PA 58197

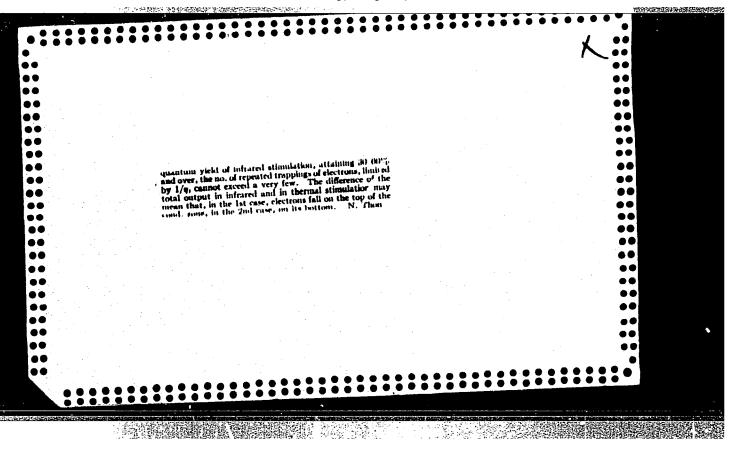
LEVSHIN, V. L.	* [-]	PA 34T100	
Phys. Inst. in. Lebeded	The radiation spectrum of uranyl sulfate at different temperatures is studied. It is shown that a change in the temperature causes a change in the distribution of energy both in the entire spectrum as a whole and within the separate bands of radiation. It is shown ID FAMILOO USER/Physics (Contd) Mar 1947 experimentally that the dark interval between moments of absorption and the beginning of radiation is either absent or has a duration of less than 3 x 10-5 seconds (<0.01 7).	USER/Physics Spectrographic Analysis Chemistry - Uranyl Salts Chemistry - Uranyl Salts The Duration of Static Distribution in Excited Molecules of Uranyl Salts, V. L. Levshin, G. D. Sheremet yev, 17 pp "Zhurnal Eksperimental noy 1 Teoreticheskoy Fiziki" Vol IVII, No 3	

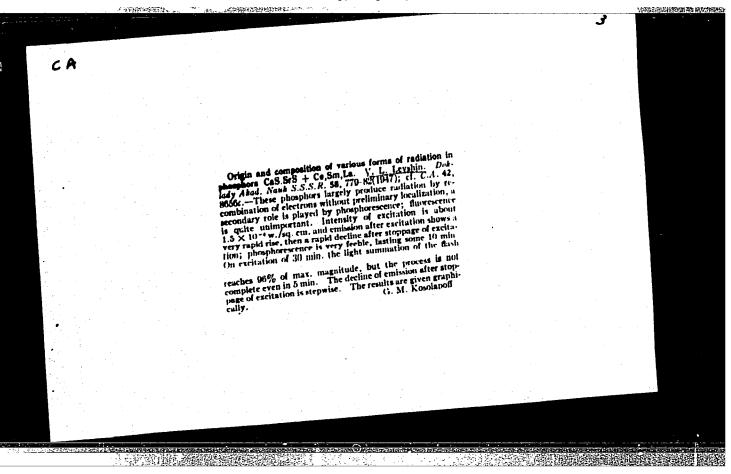


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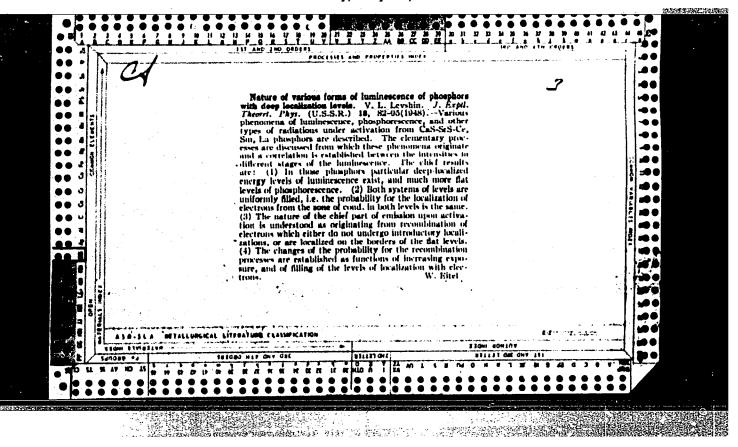






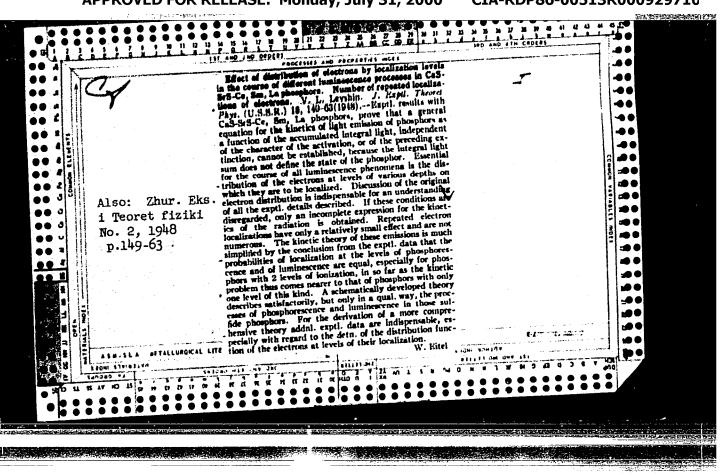
IEVSHIN, V. L.

"Different Processes for Cutting Out (vysvechivaniye) Crystalophosphoruses," Iz. Ak.
Nauk SSSR, Ser. fiz., No.3, 1948

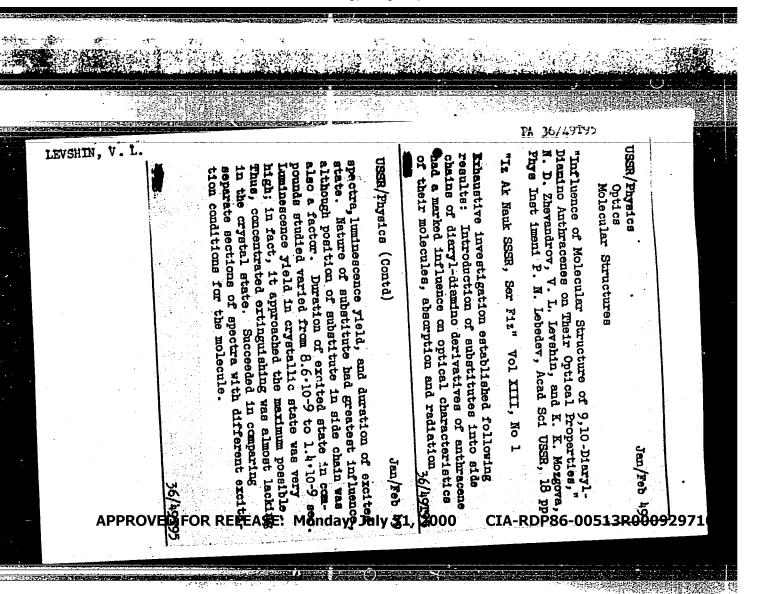


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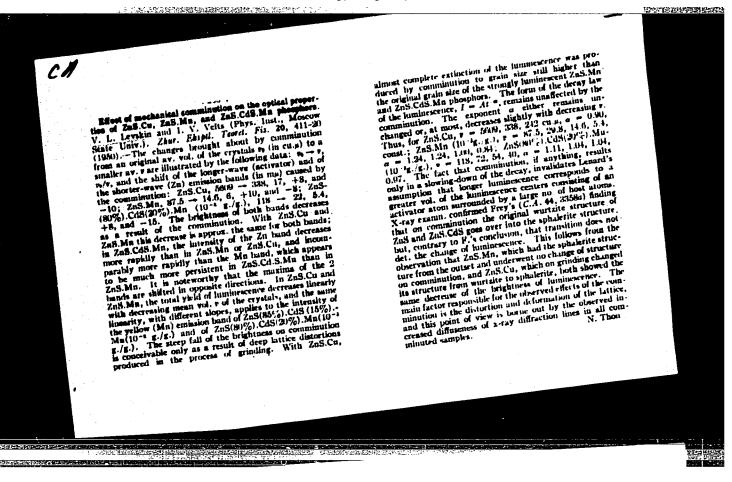
LEVSHIN, Vadim Leonidovich, 1896Fluorescent, luminiscence Moskva Pravda 1949. 38 p. (50-34215) QC477.14



USSE/Physics Imminescence Thosphore Inminescence The Flash Mechanima in Srs Phosphors as Effected The Flash Mechanima in Srs Phosphors and the Interactivity The Flash Mechanima in Srs Phosphors and the study in the interactivity The Flash Mechanima in Srs Phosphors and activators with two rare-earth activators and activators with two rare-earth activators and activators and activators with the flash in systematic and activators and activators and activators and activators with single-activated and doubles of investigations with single-activated and doubles of investigations with single-activated and doubles activated phosphors, 1.e., studies of temperature activated phosphors, 1.e., studies of the flash. Spectra, and spectral sensitivity of the flash. Spectra activated phosphors are activated and doubles are activated phosphors. Spectra activated phosphors are activated and doubles activated and sould activate and activated and doubles activated phosphors. Spectra activated phosphore activated and doubles activated phosphore activated and activated activated and activated activated activated activated activated a			A CONTRACTOR OF THE STATE OF TH		tive Popularia de la California de Papularia de la la companya de la companya de la companya de la companya de		
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		36	crderly manner, thus forming a complex center of luminescence due to certain chemical forces. luminescence due to certain chemical forces. Rases this conclusion on three independent series of investigations with single-activated and doubles of investigations i. e., studies of temperature activated phosphors, i. e., studies of temperature radiation of excited phosphors, luminescence appectra, and spectral sensitivity of the flash. Spectra, and spectral sensitivity of the flash.	result of the two rare-earth two rare-earth themselves in this thin the themselves in the thin the thi		Physics Thosphors Luminescence	9297100

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LEVSHIN, V.L.

PHASE I Treasure Island Bibliographic Report

Call No.: AF-539087, Incl. 6

00000108 BOOK

Full Title: PHCTOLUMINESCENCE OF SOLID AND LIQUID SUBSTANCES Transliterated Title: Fotoliuminestsentsiia zhidkikh i tverdykh veshchestv.

Publishing Data

Publishing House: State Publishing House of Technical-Theoretical Literature.

No. pp.: 456

Date: 1951.

Editorial Staff Editor: None.

Editor-in-Chief: None.

Technical Editor: None. Appraiser: None.

Text Data

The monograph is based on the work of Soviet scientists in the field of photoluminescence of liquids and solids. Laws of luminescence Coverage: are presented for luminosity of aromatic, hydrocarbon, acridinic, and other simple compounds; complex aromatic and organic compounds; and polyions. Special data are, also, given on the use of luminosity in illumination, radio, X-Ray, chemical analysis, and other fields of science; also, practical application in industry and home appliances. The use of luminous paints and decorations is rapidly developing:

signs, instrument parts, airfield runways, etc.

The book, with the exception of a small part, is popularly written for students, teachers, and others engaged in the field of luminosity. Purpose:

None. Facilities: No. Russian References: 617.

Available: A.I.D., Library of Congress.

- TARASOVA, T. M. LEVSHIN, V. L.
- USSR (600)
- Molecules
- Effect of the molecular structure and of the temperature of medium upon luminescence : and absorption of complex molecules. Izv AN SSSR Ser fiz No 5 1951.

Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

UBSE/Physics - Fluorescence

"Extinguishment of Fluorescent Solutions by Absorbing Sibstances, I," M. D. Galanin, L. V. Levshin, Phys Inst imeni Lebedev, Acad Sci USSE

"Zhur Eksper i Teoret Fiz" Vol XXI, No 2, pp 121-125

Examd variation of output and duration of fluorescence during extinguishment of fluorescence of 3-cence during extinguishment of fluorescence by nonfluorescent dyes and by dyed inorg extinguisher (CrGl3).

TANKS OF THE PROPERTY OF THE P

The emission of size suitide phesphore. L. A. Vinokurov. L. Leyshin, and B. G. Baranova (P. N. Lebedev Phys. 1nst. Acad. Sci. U.S. S. R., Moscow). Zher. Ehipti. Teeret. Fiz. 21, 236-51 (1951).—There types of fluorescence were fire vinstantaneous process, of < 10-s sec., not resolvable the "instantaneous" process, of < 10-s sec., not resolvable the "instantaneous" process, of < 10-s sec., not resolvable to 10-s sec., sec., and (c) the long-lived emission. The phosphoro invertigated were ZnS-Mi (I), ZnS-Cu (II), and order of 10-s sec., and (c) the long-lived emission. The phosphoro invertigated were ZnS-Mi (I), ZnS-Cu (II), and constant methods of the 2nd 2nd-And emitting both the Zn band and the band of the 2nd sapprax., but not actually, exponential with the following activator. The decay of the short-lived process (b) is test the stated concess, of the activator: I (1 × 10-s s./s.) is the stated concess, of the activator: I (1 × 10-s s./s.) is the stated concess, of the activator: I (1 × 10-s s./s.) (3 × 10-s

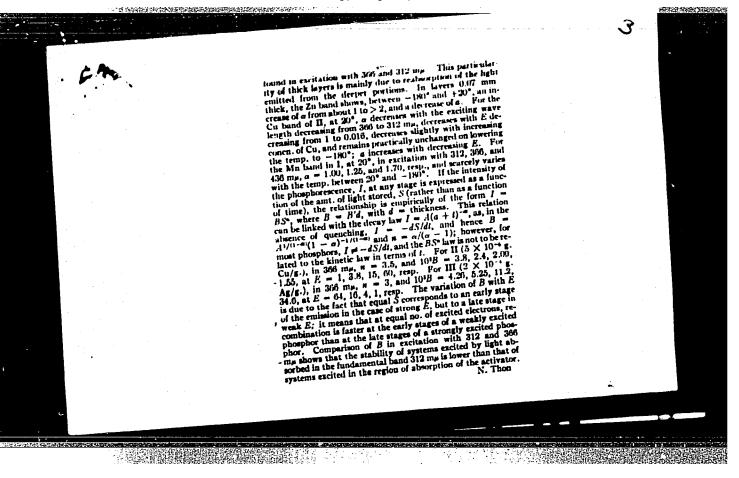
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list. Under conditions of weak racitation K, i.e. vary far below the excitation entresponding to sain., the variation of the total energies S emitted in processes (a) and (c), with the log of the conen. of the activator, varies with the phosphore log of the conen. of the activator, varies with the phosphore wave lengths, S in the exciting wave lengths; for process (a), S is always very low. For the orange band of I, in all 3 exciting wave lengths, S in is much greater than S in allow conens. wave lengths, S in is much greater than S in allow conens. Sin S for S in the process of S in S

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USSR/Physics - Luminescence, Crystals Mar 51

"Gloving of Activated Crystals," V. L. Levshin

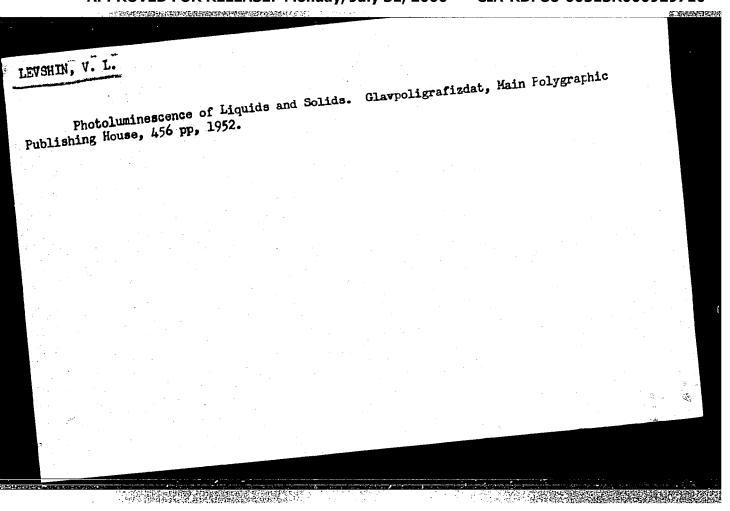
"Uspekh Fiz Nauk" Vol XLIII, No 3, pp 426-484

Surveys spontaneous, forced and recombination luminescence of crystals, absorption and emission spectra of crystallophosphors, and effect of temp on their luminescence and extinguishment.

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"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000929710



LEVSHIN, V.L.

Scientific and pedagogical activity of S.I. Vavilov. Vest. Mosk.un. 8 no.5: 3-15 My '53. (MLRA 6:8)

1. Kafedra optiki.

(Vavilov, Sergei Ivanovich, 1891-1951)

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for tific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr. 1954)

Hame

Title of Work

Rominated by

Levshin, V. F.

"Photoluminescence of Liquid and Solid Substances" Physics Institute imeni F. H. Lebedev, Academy of Sciences USSR; Moscow State University imeni M. V. Lemonosov

BO: W-30604, 7 July 1954

LEVSHIN, L. V.

Chemistry of Solutions

Dissertation: "Effect of Concentration on the Optical Properties of Solutions of Acridine and Its Derivatives." Cand Phys-Math Sci, Moscow Order of Lenin State U imeni M. V. Lomonosov, 17 Mar 54) (Vechernyaya Moskva, Moscow, 4 Mar 54)

SO: SUM 213, 20 Sept 1954

VAVILOV, S.I.; LEVSHIN, V.L., redaktor; PANKRATOV, A.V., redaktor; AUZAN, H.Pl, teknnicheskiy redaktor [Collected works] Sobranie sochinenii. Moskva, Izd-vo Akad. nauk SSSR. Vol. 1 [Works on physics, 1914-1936] Raboty po fizike, 1914-1936. 1954. 450 p. (MIRA 8:5)

(Physics)

LEVSHIN, V. L., Prof.

"The Effect of Physico-Chemical Factors on the Luminescence of Complex Molecules" a paper presented at the Conference on Molecular Luminescence and Luminescent Analysis, MINSK from 20 to 25 June 1955.

LEVSHIM, V.L., Professor, doktor fisiko matematicheskikh nauk.

Luminescence of molecules and crystals. Fanka i shisn' 22 no.5:17-20 My '55

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lononosova. (Luminescence)

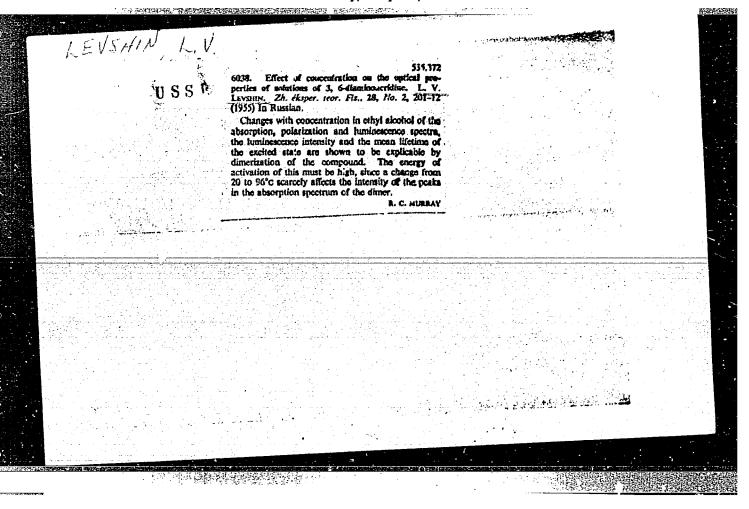
LEVSHIN, V.L., doktor fiziko-matematicheskikh nauk.

Fluorescent lighting and ways of introducing it. Vest. AM SSSR 25 no.10:54-58 0 '55. (MIRA 9:1)

(Lighting)

"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000929710



Levshin

USSR/Optics - Physical Optics

K-5

Ahs Jour

: Referat Zhur - Fizika, No 5, 1957, 12947

Author

Levshin, V.L., Laktionov, A.G.

Inst

Physics Institute, Academy of Sciences, USSR, Moscow State

University USSR

Title

: Absorption of Complex Molecules, Which are in a Metastable

State.

Orig Pub

: Dokl. AN SSSR, 1955, 103, No 1, 61-64

Abstract

Measurements were made of the absorption spectra of matastable (triplet) molecules of fluorescein in boric acid, and also of esculine, roduline orange, acrydine yellow, and rivanol in sugar drops. The spectra were measured on a recording spectra photometer GOI, and with the aid of a UM-2 monochromator, with illumination by unmodulated light (λ = 436 millimicrons). The investigated spectra are

Card 1/2

LEYSHIM, Vadim Leonidovich; SKANAVI, G.I., doktor fiziko-matematicheskikh nauk, otvetsivennyy redaktor; GRINGAUZ, V.A., redaktor izdatel'stva; PAVIOVSKIY, A.A., tekhnicheskiy redaktor

[Inminescence and its technical uses] Liuminestsentsiie i ee tekhnicheskie primeneniie. Hoskva, Ird-vo kademii nauk SSSR, 1956.

(MIRA 10:2)

(Inminescence)

VAVILOV, S.I.; IMBEDEV, A.A., akademik; TOPCHIYEV, A.V., akademik; TERENIN,
A.N., akademik; IANDSHERG, G.S., akademik; VUL, B.M.; KRAVETS, T.P.
A.N., akademik; IANDSHERG, G.S., akademik; VUL, B.M.; KRAVETS, T.P.
(deceased); LEVSHIM, V.L.; FEOFILOV, P.P.; GALAHIM, M.D.; KUNNFISOV,
I.V.; YAVILOV, V.S.; GUROV, K.P., redaktor izdatel'stva; KIERLEVA,
AIAL, tekhnicheskiy redaktor

[Gollected works] Sobranie sochinenii. Moskva, Izd-vo Akademii nauk
SSSR. Vol.4. [Experimental foundation of the theory of relativity.
On "warm" and "cold" light. The eye and the sun. Popular scientific
articles and reviews] Eksperimental'nye osnovaniia teorii otnositel'nosti, O "teplom" i "kholodnom" svete, Glaz i solntse, Nauchnonosti, O "teplom" i "kholodnom" svete, Glaz i solntse, Nauchnopopuliarnye i obzornye stat'i. 1956. 469 p.

(MIRA 9:8)

1. Chlen-korrespondent AN SSSR (for Vul, Kravets)

(Physics)

LE USHIN, V.L.

USSR / Optics

K

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10379

Author : Levshin. V.L., Tunitskaya, V.F., Cherepneva, A.A.

Inst : Physics Institute, Academy of Sciences, USSR

Title : Origin of Localization Levels in ZnS-Cu and Co Phosphors.

Orig Pub: Optika i spektrokopiya, 1956, 1, No 2, 255-263

Abstract: An investigation was made of the thermal glow (TG) of the phosphors ZnS, ZnS-Cu, ZnS-Co and ZnS-(Cu, Co) (annealing in H2SN2 and air for 30 minutes). In ZnS, the azure glow (bands at approximately 460 millimicrons) occurs only in the presence of a flux (CaCl2). The peak of TG at -130° is due to the superstoichiometric zinc (for which favorable circumstances are produced by the chlorine), and the peak at -60° is ascribed to the cxygen. The green glow is ascribed to traces of copper. In ZnS-Cu, in addition to the zinc and oxygen peaks, there appear three new peaks, barely noticeable at -5 and 0° and a considerable one at +20°. These

are ascribed to copper and appear to be the cause of the longer

Card : 1/2

Leushin, U.L.

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USSR / Optics

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10302

Author : Levshin, V.L.

: Problems of Luminescence of Crystal Phosphors. (Conference in Inst

Title Tartu).

Orig Pub: Vesta. AN SSSR, 1956, No 9, 99-100

2. 性對於於國際國際國際的

Abstract: Report on the Fifth All-Union Conference on Luminescence, held on

25-30 June 1956 in the city of Tartu.

: 1/1 Card

CIA-RDP86-00513R0009297100 **APPROVED FOR RELEASE: Monday, July 31, 2000**

LEVSHIM, V.L.

INVSHIM, V.L.

INVSHIM, V.L.

Influence of association and other physical chemical factors on the luminescence and absorption of complex molecules in solution.Ixv.

AN SSSR Ser.Fis. 20 no.4:397-409 Ap '56. (MIRA 10:1)

1. Fizicheskiy institut imeni P.N. Lebedeva Akademii nauk SSSR.
2. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

(Laminescence)

(Fluorescence)

Leushin. V.L.

K

USSR / Optics

Abs Jour: Referat Thur-Fizika, 1957, No 4, 10406

: Levshin, V.L., Baranova, E.S. Author

: Physics Institute, Academy of Sciences, USSR, Moscow : Nature of Concentration Effects in Solutions of Rhodamines. Inst

Orig Pub: Izv. AN SSSR, ser. fiz., 1956, 20, No 4, 424-432

Abstract: Description of the results of investigations, that confirm the

association character of the concentration effects in aqueous solutions of rhodamine solution 6G extra and 3B. The data on the effect of concentration and temperature on the absorption spectra and on the yield are refined. It is shown that the concentration phenomena are independent of electrolytic dissociation. The independence of the absorption in the ultraviolet region on the concentration is explained by the fact that the electrons, responsible for this absorption, do not participate in the formation of the associates. The concentration quenching and temperature

: 1/2 Card

Levshin,

USSR/ Physical Chemistry - Molecule. Chemical Bond

B-4

: Referat Zhur - Khimiya, No 3, 1957, 7193

Author

Inst

: Leyshin, V.I. : Academy of Sciences USSR

Title

: Closing Address at the Fourth Conference on Luminescence

Orig Pub

Izv. AN SSSR, Physical Series, 1956, Vol 20, No 5, 608

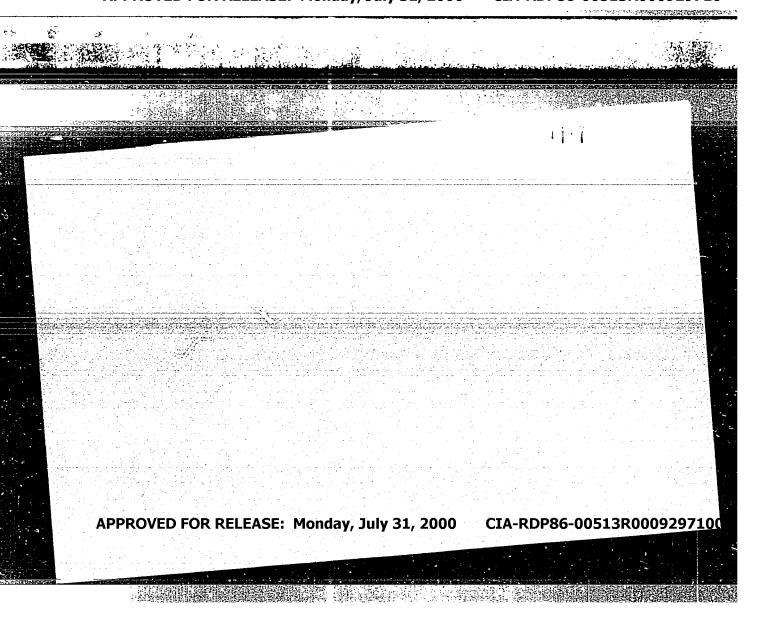
: No abstract. Abstract

Card 1/1

- 21 -

APPROVED FOR RELEASE: Monday, July 31, 2000.
LEVSHIN, V.L., doktor fiziko-matematicheskikh nauk. CIA-RDP86-00513R00092971

Problems in the luminescence of crystal phosphors (conference in Tartu). Vest.AN SSSR 26 no.9:99-100 8 156. (Phosphors)



THE THE THE THE PARTY OF THE PA 51-3-10/24 Effect of the wavelength of the exciting light and of the return of transing levels of ZnS: Cu: 70 phosphors AUTHORS: Levshin, V.L. and Tunitskaya, V. F. the nature of traps. (Vlivanive dliny volny on the filling of traps. the nature of trapping levels of ZnS:Cu:Co phosphor on the filling of traps. (Vliyaniye dliny zakhvata yozbuzhdayushchego sveta i prirody urovney zakhvata fosforov ZnS-Cu. Co na ikh zapolneniye). PERIODICALINOptike 1 Spektroskopiya (Optics and Spectroscopy),

ARGURACH: Pour Zng phognhone Total Carlos Copy) Four Zns phosphors were studied: I - Zns: Zn heated in (2 groung) TITLE: CT: Four ZnS phosphors were studied: I - ZnS: Zn heated in ZnS: Zn heated in ZnS: Cu (3 groups), II - ZnS: Cu (3 groups), and ZnS: Cu (3 groups) and znoups and some deep levels) and were znS: Cu: Co (3 groups and some deep levels) and were znS: Cu: Co in H2S (2 shallow groups). They beard in H2S (2 shallow groups) and 436 mu (absorption decreases) and 436 mu (where ZnS absorption decreases) and corrected at 366 mu (where ZnS absorption decreases). excited at -180 C with-light of 312 mm (absorption band 436 mm of ZnS), 366 mm (where ZnS absorption intensities were (Ou activator absorption). of ZnB), 366 mu (where ZnB absorption decreases) and 436 mu (ou activator absorption). 180 C to about +150 C. filling on recorded on heating from 366 mu excitation of the excitation intensities occurred with the duration of the trapping increased with value. In ZnB:Cu (heated in the trapping increased with value. ABSTRACT: the trapping increased with the duration of the excitation (heated in H₂S)

to a certain saturation value. In the phosphors II to a certain saturation value. In the phosphors shallow the shallow levels are filled first and then only the shallow levels are filled first and then only in the deep levels are filled first and then only on the temperature—intensity curves depend strongly on the temperature—intensity curves depend strongly ones. ones.

Apppor

3KUUU929

LEVSHIN, V.L.

51-3-9/14

and Neronova, G. P. Borodin, N. S. Levshin, V. L.,

On Emission of Excited Phosphors ZnS-Mn. · AUTHORS: TITLE:

(O Svechenii nakhodyashchikhaya pod vozbuzhdeniyem

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.III, Nr.3, pp.258-266.

This paper was read at the Fifth All-Union Conference on The authors studied ABSTRACT:

Luminescence (Tartu, June 26, 1956). change of emission intensity of Mn in ZnS-Mn phosphors, prepared at 850°C) at fixed temperatures

(0.001 g/g Mn, prepared at 850°C) at fixed temperatur from 20 to 170°C at various intensities of the exciting

Emission intensities and spectra were measured also

at fixed exciting intensities but at different temperatures. The phosphors were prepared in the laboratory of the

Physics Institute of the Academy of Science of USSR. Thin layers of the substances (20) were deposited on The excitation was Measurements were

plates by evaporating from alcohol. provided by a mercury lamp MPK-2. Curves giving

made at various wavelengths of excitation. dependence of brightness of Mn emission, J, on the exciting

Card 1/4

51,-3-9/14

On Emission of Excited Phosphors ZnS-Mn.

On excitation light intensity, I, are given in Fig.1. by 312 and 366 max wavelengths the emission intensity is given by Eq.1 J = aI/(I + b), where a and b are constants. Table 1 gives values of these constants a and b for curves of Fig.1 obtained at 150°C. Fig.2 gives temperature dependence of the constant a. In contrast to the curves for 312 and 366 my which show saturation at higher values of the exciting light intensity I, no such saturation was observed for excitation with 405 and 436 mm (Fig.3). Fig.4 shows temperature dependence of the emission intensity J on excitation by various wavelengths. The two upper parts of Fig. 4, obtained at 312 and 366 ma respectively, show a strong maximum at about 80-110°C. The lower two parts of Fig. 4 which represent excitation at 405 and 436 mm exhibit very weak each part of Fig. 4 represent various exciting light Table 2 gives the increase of emission on increase of temperature, relative to emission at 20°C for intensities. various 366 mu exciting light intensities.

Card 2/4

51-3-9/14

On Emission of Excited Phosphors ZnS-Mn.

excitations temperature quenching causes decrease of When the exciting light is strong temperature quenching is relatively weaker and emission at higher temperatures is up to three times the emission at 20°C. The curves of Fig. 4 show also that excitation intensity determines the temperature of maximum With increase of excitation intensity this The authors suggest a mechanism for prolonged emission by ZnS-Mn phosphors maximum occurs at higher temperatures. which takes into account electron motion in the conduction band and hole motion in the valence band. The authors also studied emission spectra of ZnS-Mn phosphors which contained transitions are shown in Fig. 5. emission spectra of Mn and were prepared at different different amounts of Mn and were prepared at different temperatures (sphalerite modification prepared at 850°C shown in Fig. 7 and wurtzite modification prepared at Table 3 gives the light sums of Mn and Zn emissions at various temperatures and activator It follows from Table 3 that: (1) on increase of temperature from 18-100°C. Zn emission disappears but is fully compensated by increase of Mn emission;

Card 3/4

51-3-9/14

On Emission of Excited Phosphors ZnS-Mn.

(2) treatment of the phosphor at a higher temperature on preparation tends to strengthen Mn emission;
(3) increase of Mn concentration from 0.001 to 0.01

g/g causes a strong increase of Mn emission and total

disappearance of Zn emission. Positions of Mn emission maxima in the sphalerite and wurtzite structures are the same: 595 mm. In emission maximum in the sphalerite modification lies at 475 mu and in the The authors thank wurtzite modification at 450 m . E. Ya. Arapova for preparation of phosphor samples. There are 8 figures, 3 tables and 8 references, 5 of which are Slavic.

Card 4/4

ASSOCIATION: Moscow State University imeni M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet im. M. V.

Lomonosova.)

January 21, 1957. SUBMITTED:

Library of Congress AVAILABLE:

CIA-RDP86-00513R000929710(APPROVED FOR RELEASE: Monday, July 31, 2000

LEUSHIN, V.L.

Contribution of Soviet Science to the study of luminescence. (MIRA 10:12) Opt.i spektr. 3 no.5:417-433 N 157.
(Luminescence)

CIA-RDP86-00513R000929710 APPROVED FOR RELEASE: Monday, July 31, 2000

Levshin, V. L., Panasyuk, Ye. I., Pakhomycheva, L. A. 75-6-12/23 The Application of Radioactive Isotopes on the Investigation of the AUTHORS: TITLE:

Volatilization of the Accelerators of Crystalline Phosphorous on Annealing (Primeneniye metoda mechenykh atomov dlya izucheniya ula= tuchiyaniya aktivatorov kristallofosforov pri prokaliyani shikhiy).

Zhurnal Analiticheskoy Khimii, 1957, Vol. 12, Nr 6, pp. 723-726 (USSR)

By the application of radioactive isotopes it was established, that PERIODICAL: on a baking of phosphors, the silver concentration in zinc sulphide ABSTRACT:

and alkaline-earthy phosphors and the zinc concentration in zinc sulm fide phosphors volatilizes from 5 to lo%. The volatilization de= pends on the basic substance. In earth-alkaline phosphors, the volatilization is not higher than loo/o, in calcium oxide 1 to 20/c, and in apatites up to 800/o. The volatilization of the accelerators from

the basic substance occurs in the first few minutes of baking. Antimony volatilizes already at low temperatures. Zn 65, Ag 110 and Sb 124

were used as radioactive isotopes. There are 3 tables, and 9 references, 1 of which is Slavic.

Fhysics Dztitute imeni P. N. Lebedev AN USSR (Fizicheskiy institut ASSOCIATION:

imeni P. N. Lebedeva-AN SSSR, Moskva).

Card 1/2

NAMES OF THE PROPERTY OF THE P CIA-RDP86-00513R000929710(

APPROVED FOR RELEASE: Monday, July 31, 2000

75-6-12/23 The Application of Radioactive Isotopes on the Investigation of the Volatilization of the Accelerators of Crytsalline Phosphereuz on Annealing.

SUBMITTED:

July 26, 1956.

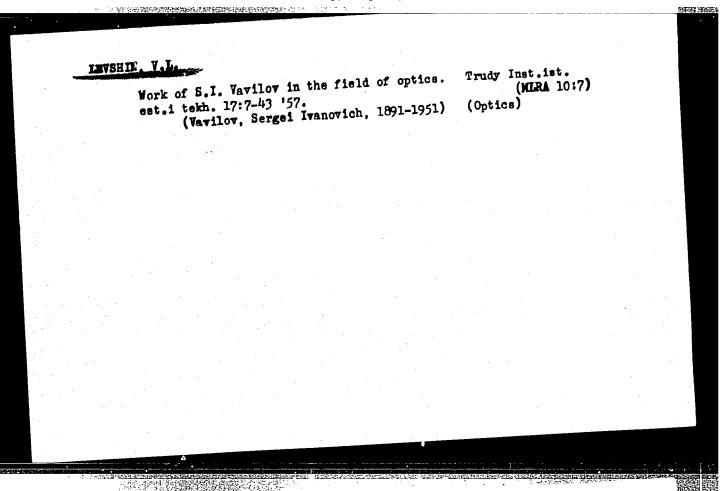
AVAILABLE:

Library of Congress.

Crystalline phosphor accelerators-Volatilization

2. Radioactive isotopes-Applications

Card 2/2



"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000929710

Levanin.V.L.

48-4-1/48

SUBJECT:

USSR/Luminescence

AUTHOR:

Levshin V.L.

TITLE:

Introductory Speech (Vstupitel'noye slove)

Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21,

PERIODICAL:

#4, pp 475-482 (USSR)

ABSTRACT:

The 5th Conference on Luminescence deals with the luminescence

of solid crystalline substances. During the last years, new methods of obtaining very pure substances for producing phosphors possessing definite properties have been developed. The method of chromatography acquired a

It was discovered that the atmosphere of calcination has a special significance. considerable effect on phosphor properties. Methods were developed which make it possible to control rigorously the

composition of calcination atmosphere.

A method of producing crystallophosphors by means of sublimation, especially used by F. Klement, was extensively applied.

Card 1/4

CIA-RDP86-00513R0009297100 APPROVED FOR RELEASE: Monday, July 31, 2000

TITLE:

48-4-1/48

Introductory Speech (Vstupitel'noye slovo) Prof. M. Konstantinova applied the thermographic analysis methods to the studies of crystal-formation processes.

New methods of analyzing the content of phosphors, such as the marked atoms method, came into use. The method of polarographic analysis was applied to determination of activator

A. Bundel' found that many metalloids, such as oxygen, selenium sulfur and tellurium, can be used as activators in phosphors of the sulfurous zinc type. He developed a method of introducing activators from the gaseous phase, which is applicable both for metals and metalloids. A conception was worked out, According to which the center of luminescence in crystallophosphors consists of the activator located in the lattice knots, and neighboring cationic and ionic knots are modified in the same way in order to compensate the charge of an alien activator.

Important results as to the structure and location of luminescent centers were obtained by P.Feofilov by means of studying polarization of luminescence radiation. The method of thermal de-luminescence was proposed and devel-

oped by Soviet physicists.

Card 2/4

TITLE:

Introductory Speech (Vstupitel noye slovo) 48-4-1/48

Ch. Lushchik and I. Parfianovich considerably improved the theory which connects the temperatures of maximum luminescence theory which connects the temperatures of maximum luminescence with energetic depth of the levels of electron localization; with energetic depth of the rmal de-luminescence furnished a In this way, the method of thermal de-luminescence furnished a convenient way for the determination of localization levels in various phosphors and their filling with electrons.

Another method used in studying crystallophosphors was by measuring their electric properties, in particular the changes of their dielectric constant.

N. Tolstoy developed devices for measuring the times of phosphorescence decay and flash of the order of 10-6 to 10-7 sec. With the aid of new devices it was possible to investigate not only luminescence but also photoconductivity. A. Bonch-not only luminescence a very good fluorometer for studying Bruyevich constructed a very good fluorometer for studying luminescence lasting from 10-9 to 10-10 sec.

Several new types of tube luminophores were obtained. Some of them, as for instance double-activator calcium phosphate, correct the red portion in the emission spectrum of luminescent tubes. New phosphore, such as arsenates, germanates, etc, were devised for correcting the luminescence of super-high pressure tubes used for street illumination.

card 3/4

"APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000929710

TITLE:

Introductory Speech (Vstupitel'noye slovo)

48-4-1/48

Compounds of permanent action with a quite new mode of activation were developed: radioactive beta-emitters were used.

Flash phosphors for dosage metering of hard radiation and

radioactive substances were developed.

No references are cited.

INSTITUTION: Not indicated

PRESENTED BY:

SUBMITTED:

No date indicated

AVAILABLE:

At the Library of Congress.

Card 4/4

Leushin, V.L.

48-4-6/48

SUBJECT:

USSR/Luminescence

AUTHORS:

Levshin V.L., Borodin N.S. and Meronova G.P.

TITLE:

On Luminescence of ZnS-Mn-Phosphore Being under Excitation (O svechenii nakhodyashchikhsya pod vozbuzhdeniyem ZnS-Mn-

fosforov)

PERIODICAL:

Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957,

Vol 21, #4, pp 499-501 (USSR)

ABSTRACT:

Changes in the brightness of the manganese band of ZnS-Mn-phosphors with the rise of excitation intensity were investigated. Experiments were carried out with the following wavelengths of the exciting radiation: 312; 366; 405 and 436 m μ , lengths of the exciting radiation: 312; 366; 405 and 436 m μ , and under the following temperatures: 20; 50; 110; 130 and 150°C.

Luminescence saturation was detected at excitation by 312 and 360 m μ wavelengths. The course of saturation curves is ex-

pressed by the formula:

 $J = \frac{aI}{I+b}$

Card 1/3

48-4-6/48

TITLE:

On Luminescence of ZnS-Mn-Phosphors Being under Excitation (O svechenii nakhodyashchikhaya pod vozbuzhdeniyem ZnS-Mn-fosforov)

where J is the brightness of phosphor luminescence, I is the intensity of exciting light, and a and b are constants.

At the excitation by the lines of 405 and 436 m μ the rise of luminescence brightness occurred almost proportionally to excitation intensity and only slight traces of saturation were observed at very high intensities.

The temperature rise increases sharply the luminescence in the manganese band. Beginning from 70°C the temperature quenching is detected.

Emission spectra of the sphalerite and wurtzite modifications of ZnS-Mn-phosphors with various manganese concentrations and at various temperatures were also investigated. It was found out that the wurtzite modification favors development of manganese luminescence. The blue zinc luminescence is observed only at low temperatures. The rise of temperature causes the transfer of zinc luminescence into manganese one.

Card 2/3

Levshin, V.L.

48-4-44/48

SUBJECT:

USSR/Luminescence

AUTHORS:

Levshin V.L., Panasyuk Ye.I. and Pakhomycheva L.A.

TITLE:

Luminescent Substances of Permanent Action with Artificially Radioactive Beta-Isotopes (Svetyashchiyesya sostavy postoyannogo deystviya s iskustvenno-radioaktivnymi beta-izotopami)

Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957.

Vol 21, #4, pp 612-618 (USSR).

ABSTRACT:

PERIODICAL:

The Physical Institute im. Lebedev has developed since 1950 luminescent substances of permanent action activated with various radioactive isotopes. After investigations of numerous phosphors it was established that the ZnS-Cu phosphor is most luminous at beta-excitation.

The following conclusions resulted from these investigations:

1. Sr⁹⁰ isotope, and in some cases Cs¹³⁷ isotope, are recommended for luminescent substances of permanent action:

2. Luminescent substances activated with Sr 90 can have a service time of the order of 10 years and more;

Card 1/2

TITLE:

48-4-44/48
Luminescent Substances of Permanent Action with Artificially
Radioactive Beta-Isotopes (Svetyashchiyesya sostavy postoyannogo deystviya s iskustvenno-radioaktivnymi beta-izotopami)

- 3. The maximum brightness of green compounds with Sr⁹⁰ can exceed the brightness of compounds used at present by 10 times and even more;
- 4. Luminescent compounds of various colors, luminous enough for practical applications, have been produced.
- 5. Organic and silicate glasses with addition of 1% of cerium dioxide are recommended as protective shields.

The article contains 8 graphs. The bibliography lists 1 reference, translation into Russian. The report was followed by a discussion.

INSTITUTION: Physical Institute im. Lebedev of the USSR Academy of Sciences

PRESENTED BY:

SUBMITTED: No date indicated

AVAILABLE: At the Library of Congress

Card 2/2

LEVSHIN VIL

48-5-28/56

SUBJECT:

USSR/Luminescence

AUTHORS:

Levshin V. L. and Tunitskaya V.F.

TITLE:

Nature of Localization levels in ZnS-Cu, Co-Phosphors and Their Filling under Various Excitation Conditions (Priroda urovney lokalizatsii ZnS-Cu, Co-fosforov i ikh zapolneniye v rasnykh

usloviyakh vozbuzhdeniya)

PERIODICAL:

Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957,

Vol 21, #5, pp 695-696 (USSR)

ABSTRACT:

The magnitude and distribution of the light-sum of ZnS-Cu, Co phosphors over the levels of various nature and depth, and their dependence on excitation time and wavelength of exciting light were investigated. It was established that:

1. The probability of filling one or another group of levels for a given wavelength of exciting light depends not only on the depth of the levels but also on their origin.

2. The wavelength of exciting light affects strongly the

distribution of electrons over the levels of different depths.

3. No transitions of electrons from the shallow levels into deeper ones were observed during thermal de-luminescence, when

Card 1/2

48-5-28/56

TITLE:

Nature of Localization levels in ZnS-Cu, Co-Phosphors and Their Filling under Various Excitation Conditions (Priroda urovney lokalizatsii ZnS-Cu, Co-fosforov i ikh zapolneniye v raznykh usloviyakh vozbuzhdeniya)

shallow levels were mainly filled but there were many unfilled

deeper levels.
4. The radiation with longer wavelengths affects more those electrons which are in the shallow levels. Some part of optically liberated electrons are transferred thereby from the shallow levels to deeper ones.

The report was followed by a short discussion.

Two Russian references are cited.

INSTITUTION: Physical Institute im. Lebedev of the USSR Academy of Sciences.

PRESENTED BY:

SUBMITTED:

No date indicated

AVAILABLE:

At the Library of Congress.

Card 2/2

· LEVSHIN V.L.

48-5-29/56

SUBJECT:

USSR/Luminescence

Levshin, V.L. and Ryshikov, B.D.

AUTHORS:

On the Formation of Localization Levels in ZnS-Mn-Phosphors

TITLE

(Ob obrasovanii urovney lokalisatsii ZnS-Mn-fosforov)

PERIODICAL:

Izvestiya Akademii Hauh SSSR, Seriya Fizicheskaya, 1957,

Vol 21, #5, pp 696-698 (USSE)

ABSTRACT:

Curves of thermal de-luminescence for the blue luminescence of the wurtzite modification of ZnS-Mn-phosphors make it possible to detect 4 systems of localization levels. Peak positions in the thermal de-luminescence curves for shallow levels depend on the concentration of activator, namely the peaks shift to lower temperatures with an increase of Mn concentration. The relative development of thermal de-luminescence bands de-

pends considerably on Mn concentration. The deepest levels obtain maximum development at a Mn-concentration of 3x10-5 g/g.

Thermal de-luminescence curves for the orange luminescence reveal an additional maximum at 265°C. The relative development and position of thermal de-luminescence bands also greatly

depend on the Mn-concentration.

Card 1/2

LEVSniN, V-L.

48-5-55/56

SUBJECT:

USSR/Luminescence

AUTHOR:

Levshin V. L.

TITLE:

Concluding Speech (Zaklyuchitel'noye slovo)

Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957,

PERIODICAL:

Vol 21, #5, pp 781-782 (USSR)

ABSTRACT:

The speaker noted the creation of a new large investigation center in Tartu headed by F.D. Klement, Rector of the Tartu University, and Ch.B. Lushchik who in addition are conducting original scientific investigations in the Central-Asian Univer-

Considerable number of chemists participated in the 5th Confer-

A considerable progress in the development of luminophore in-

The memory of S.I. Vasilov who greatly contributed to the science of luminescence was honored by standing up of all participants

of the conference.

Card 1/2

48-5-55/56

TITLE:

Concluding Speech (Zaklyuchitel'noye slovo)

INSTITUTION: Not indicated

PRESENTED BY:

SUBMITTED:

No date indicated

AVAILABLE: At the Library of Congress.

Card 2/2

"APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000929710

|--|

51-4-3-12/30

Ryzhikov, B.D. AUTHORS: Levshin, V.L. and

Formation and Action of Localization Levels in ZnS-Mn · TITLE:

(Ob obrazovanii i deystvii urovney Phosphors

lokalizatsii ZnS-Mn-fcsforov.)

PERIODICAL: Optika i Spektroskepiya, 1958, Vol.IV, Nr.3,

pp.358-364 (USSR)

This paper was presented at the Fifth Conference on The Local trapping ABSTRACT:

Luminescence on June 28, 1956. levels in ZnS-Mn phosphors were studied by means of Measurements

measurement of thermal stimulation curves. were made on two series of phosphors in which concentration of Mr. was varied between 0 to 0.1 g/g. Phosphors were prepared in covered crucibles using NaCl flux. Thir phosphor layers (0.018 mm) were used for measurements. Excitation was sufficiently strong to make stored light-sums reach their maxima

at a given temperature and wavelength of exciting light. Mercury lines were used for excitation. The phosphor was excited at - 190°C and was then heated at a uniform rate of 20 deg/min. In phosphors with Mn concentration

tions from 0 to 0.001 g/g blue emission was observed. Orange emission was observed at Mn concentrations from

Card 1/4

51.4 -3-12/30

ZrS. Min Phosphors. Formation and Action of Localization Levels in Fig.1 shows thermal stimulation curves for ZnS-Mr. phosphors with various amounts of Mn which were excited at - 19300 by the 365 mu line. Fig.la represents blue emission, Fig.lb - orange emission. Fig.2 gives change in thermal stimulation of ZnS-Mn on change of wavelength of the exciting light. Table 1 gives the positions of the maxima of thermal stimulation curves. For the blue emission there are

three maxima: I, near - 100°C; II, near - 50°C; III, near - 30°C. For the orange emission there are four maxima: I, near - 100°C; II, near - 40°C; III, near - 20°C; IV, near - 5°C. Table 2 gives the positions of the thermal stimulation maxima of ZnS-Mn phosphors excited by various wavelengths. Table gives the changes of light-sums of blue and orange afterglow on change of Mn concentration. Table 4 gives the relative intensities of the maxima of crange and blue emission and integral light-sums on excitation with various wavelengths. In Table 5 the relative intensities of the orange and blue maxima are given for

ZnS-Mn phosphers with various concentrations of Mn.

Card 2/4

51-4-3-12/30

Formation and Action of Localization Levels in ZnS-in Phosphors.

Fig.3 gives the absorption spectra of ZnS-Mn phosphors Comparison of the with various concentrations of Mn. thermal stimulation curves of ZnS-Mn phosphers shows that the positions of the maxima II and III of blue emission are displaced towards lower temperatures compared with the corresponding positions of orange The results are interpreted as follows. maxima. On thermal liberation of electrons from local trapping levels the probability of excitation of Mn centres increases and probability of excitation of blueemission centres decreases with increase of level depth. The total light-sum of the blue emission is not greatly affected by the wavelength of the exciting light, in contrast to the light-som of the orange emission which depends strongly on the wavelength of excitation. both the blue and orange emissions excited by 436 and 405 mm lines the main thermal stimulation maxima are due to liberation of electrons from deep levels. low concentrations of Mn (up to 0.0001 g/g) the absorption decreases and the blue-emission intensity increases with increase of Mr content. On further

Card 3/4

51-4-3-12/30

Formation and Action of Localization Levels in ZrS-Mr Phosphors.

increase of Mn concentration the blue emission weakens, the orange emission increases and a new system of deep levels near -5°C is formed. Mn ions at low concentrations occupy positions around defects in the crystal lattice, but with increase of Mn concentration the activator ions replace Zn ions at lattice sites. There are 3 figures, 5 tables and 11 references, of which 7 are Soviet, 2 American, 1 Dutch and 1 German.

ASSOCIATION: Physics Institute imeni P.N. Lebedev, Academy of Sciences of the USSR; Mcscow State University (Fizicheskiy institut im. P.N. Lebedeva AN SSSR; Moskovskiy gosudarstvennyy universitet.)

SUBMITTED: May 16, 1957.

1. Phosphers-Laminescence-Thermal effects

Card 4/4

SOV/30-58-7-4/49

AUTHOR:

Levshin, V. L., Doctor of

Physical and Mathematical Sciences

TITLE:

New Trends in the Investigation of Luminescence and the Development of Its Applications (Novyye napravleniya v izuchenii

lyuminestsentsii i razvitiye yeye primeneniy)

PERIODICAL:

Vestnik Akademii nauk SSSR, 1958, Nr 7, pp. 26 - 31 (USSR)

ABSTRACT:

The work carried out by S.I. Vavilov, by his successors and students made it possible to determine the general rules governing the phenomena of luminescence both in the liquid and solid phase. At present, the development of both vacuum- and radio engineering favors the investigation of the kinetics and energy conditions of the processes of luminescence caused by corpuscular excitation. It is possible to carry out investigations of luminescence caused by particles with different energies. This includes cathode- and scintillation luminescence. In these investigations, particles are concerned which show energies of from hundred thousands up to several million electron-

Card 1/4

Volts. At present, the luminescence of crystals under the

New Trends in the Investigation of Luminescence and the Development of Its Applications

sov/30-58-7-4/49

direct action of an intense electric field is usually called electric luminescence which was discovered for the first time by both the Soviet physicist O.V.Losev and the German physicist P.Pol. The duration of the state of excitation and of the luminescence of the molecules fluctuated from 10^{-10} seconds up to several seconds, which can be measured for the time being with sufficient accuracy by means of new instruments. One of the most important problems of molecular luminescence is closely connected with the utilization of low temperatures and consists in the investigation of the transition of molecules in biradical state. The conference on molecular luminescence held in February of this year - besides the one on crystal phosphors which took place last year - showed the rapid increase and the development of the application of luminescence in widely different fields of national economy. The following examples are given: Admixtures of luminescent substance protect synthetic materials against the decomposing luminous effect and thus considerably prolong their life. A luminescence coating of sand grains makes it possible to observe the washing away of sand by water, which is of great importance for the construction of hydrotechnical

Card 2/4

New Trends in the Investigation of Luminescence and the Development of Its Applications

sov/30-58-7-4/49

plants. A considerable development is also found with the use of luminescent dyes for dyeing microscopic preparations. It is further found that the production of new types of phosphorescent stones has not yet been started and that the results obtained theoretically in the field of luminescence are insufficiently exploited by the industry of the USSR. The Laboratory of Luminescence at the Physics Institute imeni P.N.Lebedev is not in a position to meet all requirements. It is time to build a special Institute of Luminescence within the system of AS USSR.

Card 3/4

507/48-22-9-7/40 Levshin, V. L., Baranova, Ye. G. AUTHORS:

Various Kinds of Concentration Extinguishing and the TITLE:

Possibility of Their Classification (Razlichnyye vidy kontsentratsionnogo tusheniya i vozmozhnost' ikh razdeleniya)

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958, PERIODICAL:

Vol 22 , Nr 9, pp 1038 - 1042 (USSR)

This is the short abstract of a lecture which to its ABSTRACT:

whole extent is published in the periodical "Optika i spektroskopiya", 1958. The present paper is the continuation of the investigations (Refs 1,2) that are carried out to explain the nature of the concentration extinguishing of dye solutions. The rhodamine solutions

6 Zh and 3 B in water and ethyl alcohol were chosen as test samples. The authors regard the following 3 kinds

of concentration extinguishing to be principally possible:

1) By inactive absorption of the exciting light by nonluminescing associates; 2) by transfer of the ex-

citation energy from the excited monomer to the non-

luminescing associates by means of induction; 3) by transfer Card 1/4

CIA-RDP86-00513R000929710(APPROVED FOR RELEASE: Monday, July 31, 2000

Various Kinds of Concentration Extinguishing and the Possibility of Their Classification

SOV/48-22-9-7/40

of the energy from the excited monomer to the nonexcited one. In the latter case the decrease in yield is caused by the fact that a part of the transitions leads to a dispersion of the excitation energy. The authors observed the formation of nonluminescing associates at higher concentrations and determined their number. Furthermore a scheme for the classification of the mentioned processes of extinguishing was worked out. In aqueous solutions of rhodamine 6 Zh and 3 B practically no association is found unto concentrations of 4.10^{-6} Mol t^{-1} . The investigation of the luminosity In of thin layers of dye solutions yielded the data listed in table 1. The solubility of the dyes in alcohol is considerably higher than in water. In this case concentrations of 1,6.10⁻¹ Mol t^{-1} may occur. In aqueous solutions they cannot surmount $3.10^{-3} \div 10^{-2}$ Mol t^{-1} . It seems to be probable that the migration extinguishing in the transmission of energy from one monomer to the other one is more efficient in water than in alcohol. The possibility of the formation of complicated associates

Card 2/4

Various Kinds of Concentration Extinguishing and the Possibility of Their Classification

SOV/48-22-9-7/40

from the molecules of two different dyes - rhodamine 6 2h and 3B -was investigated. The different spectra prove the formation of complicated associates. The latter ones are less stable than the associates of single components; they disintegrate when the solutions are heated to 80°. At this temperature the observed spectrum of the binary solution agrees with the calculated one. In the association the change of the absorption spectra is restricted to the first absorption band in the visible part of the spectrum. The ultraviolet range of the spectrum in the case of simple as well as of complicated associates agrees with the spectrum of the non-associated molecules and is very similar for both dyes. Thus the association only modifies the cloud of the π -electrons. The authors acknowledge the assistance of L.V. Krotova . There are 2 figures, 2 tables, and 2 references, 2 of which are Soviet.

Card 3/4

Various Kinds of Concentration Extinguishing and the Possibility of Their Classification

SOV/48-22-9-7/40

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Card 4/4

CIA-RDP86-00513R0009297100 APPROVED FOR RELEASE: Monday, July 31, 2000

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53-1-3/8

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TITLE:

The Study of the Phenomera of Luminescence and the Development of Their Applications in the Soviet Union (Izucheniye yavleniy lyuminestsentsii i razvitiye yeye

primeneniy v Sovetskom Soyuze)

PERIODICAL:

Uspekhi Fizicheskikh Nauk, 1958, Vol. 64, Nr 1, pp. 55-92

(USSR)

ABSTRACT:

This short work of course cannot give a complete idea of the development of the theory on luminescence in the Soviet Union, for more than 3000 Sovietic papers exist on this field. Therefore the author restricts himself on the examination of the central problems, which were raised and solved by the Sovietic scientists. In this case many important investigations, especially on the chemistry of luminiphors and also some theoretical works, must remain neglected. Also the development of the applications of luminescence is discussed very shortly. This survey is arranged as follows: The yield of luminescence, the processes in case of extinction of the luminescence; the

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDDS6 The Study of the Phenomena of Luminescence and the Development of Their Applications in the Soviet Union

53-1-3/8

phenomena on occasion of the transmission of the excitation energy; the polarization of the luminescence; the duration of the luminescence and the laws of attenuation; the apparatus for the examination of the phenomena of luminescence, the spectroscopic investigation and the spectral laws; the crystal phosphorescent substances; the levels of the localisation of the charges; the probabilities of recombination and localisation of electrons; the optical and thermal electrons; the centers of luminescence the non-linear effects of the luminescence of crystal phosphorescent substances, the luminescence in case of the corpuscular stimulation and the electroluminescence. Finally the author makes a short report on some applications of the luminescence: Here especially the applications in qualitative and quantitative analysis are to be mentioned. Very numerous, too, are the applications of the luminescence in biology and medicine, by this means, i. g. has been studied the migration of the energy in an albumin molecule. Further luminescent materials are used for colour separation in cartography and as inhibitors for the weakening of photochemical effects. Also the

Card 2/3